

The Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1-10. (Canceled)

11. (Previously presented) An isolated pancreatic stem cell that can be separated from the pancreas of a mammal by the method described in claim 76.

12. (Previously presented) The isolated pancreatic stem cell of claim 90, which shows 4 markers of c-Met, c-Kit, CD45 and TER119 in a pattern of c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻.

13. (Previously presented) The isolated pancreatic stem cell of claim 11, which shows 5 markers of c-Met, c-Kit, CD45, TER119 and Flk-1 in a pattern of c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻, Flk-1⁻.

14. (Withdrawn) A method of screening a substance that induces differentiation of a pancreatic stem cell of a mammal, which comprises the following steps: (i) a step of reacting a pancreatic stem cell with a test substance, and (ii) a step of determining the expression of a pancreatic marker in the cell after the reaction.

15. (Withdrawn) A method of screening a substance that induces differentiation into liver·bile duct or stomach·intestine of a mammal, which comprises the following steps: (i) a step of reacting a pancreatic stem cell of claim 12 with a test substance, and (ii) a step of determining the expression of a liver·bile duct or stomach·intestine marker in the cell after the reaction.

16. (Withdrawn) A method of screening a substance that regulates a pancreatic function of a mammal, which comprises the following steps: (i) a step of reacting a pancreatic stem cell or a cell differentiated from the stem cell with a test substance, and (ii) a step of determining the expression of a pancreatic marker in the cell after the reaction.

17. (Withdrawn) A method of screening a substance that regulates the function of liver-bile duct or stomach-intestine of a mammal, which comprises the following steps: (i) a step of reacting a pancreatic stem cell of claim 12 or a cell differentiated from the stem cell with a test substance, and (ii) a step of determining the expression of a liver-bile duct or stomach-intestine marker in the cell after the reaction.

18. (Previously presented) A cloned pluripotent pancreatic stem cell, that shows c-Met⁺, c-Kit⁻, CD45⁻ and TER119⁻.

19. (Previously presented) A cloned pluripotent pancreatic stem cell, that shows c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻ and Flk-1⁻.

20. (Previously presented) A pharmaceutical composition, which comprises: i) a cloned pluripotent pancreatic stem cell of claim 18 and ii) a pharmaceutically acceptable carrier.

21. (Previously presented) A purified composition, which comprises: a cloned pluripotent pancreatic stem cell of claim 18.

22. (Withdrawn) Tissue regenerated from a cloned pluripotent pancreatic stem cell of claim 18.

23. (Withdrawn) An organ regenerated from a cloned pluripotent pancreatic stem cell of claim 18.

24. (Withdrawn) A method of transplanting a cloned pluripotent pancreatic stem cell into a host, which comprises: i) obtaining the cloned pluripotent pancreatic stem cell of claim 18; and ii) transplanting said stem cell into the host.

25-29. (Canceled)

30. (Previously presented) The method of claim 75, wherein the separated cells express a marker protein pattern of c-Met⁺, c-Kit⁻, CD45⁻ and TER119⁻.

31. (Previously presented) The method of claim 76, wherein the separated cells express a marker protein pattern of c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻ and Flk-1⁻.

32. (Withdrawn) An agent for the prophylaxis or treatment of a pancreatic hypofunctional disease, which comprises the pancreatic stem cell of claim 12, or a cell differentiated from the stem cell.

33. (Withdrawn) The agent of claim 32, wherein the pancreatic hypofunctional disease is a disease selected from the group consisting of diabetes, chronic pancreatitis, autoimmune pancreatitis and pancreatic functional disorder from surgical removal of all or part of a pancreas.

34. (Withdrawn) An agent for the prophylaxis or treatment of a hypofunctional disease of the liver-bile duct, which comprises the pancreatic stem cell of claim 12, or a cell differentiated from the stem cell.

35. (Withdrawn) The agent of claim 34, wherein the hypofunctional disease of the liver-bile duct is a disease selected from the group consisting of acute hepatitis, chronic hepatitis, metabolic liver disease and hepatic functional disorder from surgical removal of all or part of a liver.

36. (Withdrawn) An agent for the prophylaxis or treatment of a hypofunctional disease of the stomach-intestine, which comprises the pancreatic stem cell of claim 12, or a cell differentiated from the stem cell.

37. (Withdrawn) The agent of claim 36, wherein the hypofunctional disease of the stomach-intestine is a disease selected from the group consisting of short bowel syndrome, inflammatory bowel disease, and stomach functional disorder from surgical removal of all or part of a stomach.

38-39. (Canceled)

40. (Previously presented) An isolated pancreatic stem cell that can be separated from the pancreas of a mammal by the method described in claim 75.

41. (Previously presented) An isolated pancreatic stem cell that can be separated from the pancreas of a mammal by the method described in claim 76.

42. (Previously presented) An isolated pancreatic stem cell that can be separated from the pancreas of a mammal by the method described claim 79.

43. (Previously presented) The isolated pancreatic stem cell of claim 40, which shows 4 markers of c-Met, c-Kit, CD45 and TER119 in a pattern of c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻.

44. (Previously presented) The isolated pancreatic stem cell of claim 41, which shows 4 markers of c-Met, c-Kit, CD45 and TER119 in a pattern of c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻.

45. (Previously presented) The isolated pancreatic stem cell of claim 42, which shows 4 markers of c-Met, c-Kit, CD45 and TER119 in a pattern of c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻.

46. (Previously presented) The isolated pancreatic stem cell of claim 40, which shows 5 markers of c-Met, c-Kit, CD45, TER119 and Flk-1 in a pattern of c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻, Flk-1⁻.

47. (Previously presented) The isolated pancreatic stem cell of claim 41, which shows 5 markers of c-Met, c-Kit, CD45, TER119 and Flk-1 in a pattern of c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻, Flk-1⁻.

48. (Previously presented) The isolated pancreatic stem cell of claim 42, which shows 5 markers of c-Met, c-Kit, CD45, TER119 and Flk-1 in a pattern of c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻, Flk-1⁻.

49. (Withdrawn) A method of screening a substance that induces differentiation into liver·bile duct or stomach·intestine of a mammal, which comprises the following steps: (i) a step of reacting a pancreatic stem cell of claim 13 with a test substance, and (ii) a step of determining the expression of a liver·bile duct or stomach·intestine marker in the cell after the reaction.

50. (Withdrawn) A method of screening a substance that regulates the function of liver·bile duct or stomach·intestine of a mammal, which comprises the following steps: (i) a step of reacting a pancreatic stem cell of claim 13 or a cell differentiated from the stem cell with a test substance, and (ii) a step of determining the expression of a liver·bile duct or stomach·intestine marker in the cell after the reaction.

51. (Previously presented) A pharmaceutical composition, which comprises: i) a cloned pluripotent pancreatic stem cell of claim 19; and ii) a pharmaceutically acceptable carrier.

52. (Previously presented) A purified composition, which comprises: a cloned pluripotent pancreatic stem cell of claim 19.

53. (Withdrawn) Tissue regenerated from a cloned pluripotent pancreatic stem cell of claim 19.

54. (Withdrawn) An organ regenerated from a cloned pluripotent pancreatic stem cell of claim 19.

55. (Withdrawn) A method of transplanting a cloned pluripotent pancreatic stem cell into a host, which comprises: i) obtaining the cloned pluripotent pancreatic stem cell of claim 19; and ii) transplanting said stem cell into the host.

56. (canceled)

57. (Withdrawn) An agent for the prophylaxis or treatment of a pancreatic hypofunctional disease, which comprises the pancreatic stem cell of claim 13, or a cell differentiated from the stem cell.

58. (Withdrawn) An agent for the prophylaxis or treatment of a pancreatic hypofunctional disease, which comprises the pancreatic stem cell of claim 18, or a cell differentiated from the stem cell.

59. (Withdrawn) An agent for the prophylaxis or treatment of a pancreatic hypofunctional disease, which comprises the pancreatic stem cell of claim 19, or a cell differentiated from the stem cell.

60. (Withdrawn) The agent of claim 57, wherein the pancreatic hypofunctional disease is a disease selected from the group consisting of diabetes, chronic pancreatitis, autoimmune pancreatitis and pancreatic functional disorder from surgical removal of all or part of a pancreas.

61. (Withdrawn) The agent of claim 58, wherein the pancreatic hypofunctional disease is a disease selected from the group consisting of diabetes, chronic pancreatitis, autoimmune pancreatitis and pancreatic functional disorder from surgical removal of all or part of a pancreas.

62. (Withdrawn) The agent of claim 59, wherein the pancreatic hypofunctional disease is a disease selected from the group consisting of diabetes, chronic pancreatitis, autoimmune pancreatitis and pancreatic functional disorder from surgical removal of all or part of a pancreas.

63. (Withdrawn) An agent for the prophylaxis or treatment of a hypofunctional disease of the liver-bile duct, which comprises the pancreatic stem cell of claim 13, or a cell differentiated from the stem cell.

64. (Withdrawn) An agent for the prophylaxis or treatment of a hypofunctional disease of the liver-bile duct, which comprises the pancreatic stem cell of claim 18, or a cell differentiated from the stem cell.

65. (Withdrawn) An agent for the prophylaxis or treatment of a hypofunctional disease of the liver-bile duct, which comprises the pancreatic stem cell of claim 19, or a cell differentiated from the stem cell.

66. (Withdrawn) The agent of claim 63, wherein the hypofunctional disease of the liver-bile duct is a disease selected from the group consisting of acute hepatitis, chronic hepatitis, metabolic liver disease and hepatic functional disorder from surgical removal of all or part of a liver.

67. (Withdrawn) The agent of claim 64, wherein the hypofunctional disease of the liver-bile duct is a disease selected from the group consisting of acute hepatitis, chronic hepatitis, metabolic liver disease and hepatic functional disorder from surgical removal of all or part of a liver.

68. (Withdrawn) The agent of claim 65, wherein the hypofunctional disease of the liver-bile duct is a disease selected from the group consisting of acute hepatitis, chronic hepatitis, metabolic liver disease and hepatic functional disorder from surgical removal of all or part of a liver.

69. (Withdrawn) An agent for the prophylaxis or treatment of a hypofunctional disease of the stomach-intestine, which comprises the pancreatic stem cell of claim 13, or a cell differentiated from the stem cell.

70. (Withdrawn) An agent for the prophylaxis or treatment of a hypofunctional disease of the stomach-intestine, which comprises the pancreatic stem cell of claim 18, or a cell differentiated from the stem cell.

71. (Withdrawn) An agent for the prophylaxis or treatment of a hypofunctional disease of the stomach-intestine, which comprises the pancreatic stem cell of claim 19, or a cell differentiated from the stem cell.

72. (Withdrawn) The agent of claim 69, wherein the hypofunctional disease of the stomach-intestine is a disease selected from the group consisting of short bowel syndrome, inflammatory bowel disease, and stomach functional disorder from surgical removal of all or part of a stomach.

73. (Withdrawn) The agent of claim 70, wherein the hypofunctional disease of the stomach-intestine is a disease selected from the group consisting of short bowel syndrome, inflammatory bowel disease, and stomach functional disorder from surgical removal of all or part of a stomach.

74. (Withdrawn) The agent of claim 71, wherein the hypofunctional disease of the stomach-intestine is a disease selected from the group consisting of short bowel syndrome, inflammatory bowel disease, and stomach functional disorder from surgical removal of all or part of a stomach.

75. (Previously presented) A method of separating a pancreatic stem cell from the pancreas of a mammal, comprising:

isolating pancreatic cells from the pancreas of a mammal to produce pancreatic cells;

contacting the pancreatic cells with at least four antibodies and/or functional fragments thereof each having specific affinity for a different marker protein selected from the group consisting of c-Met, c-Kit, CD45, and TER119; and

separating the pancreatic stem cells from the pancreatic cells based on antibody binding between the antibodies and/or functional fragments thereof and the marker proteins to produce separated cells.

76. (Previously presented) A method of separating a pancreatic stem cell from the pancreas of a mammal, comprising:

isolating pancreatic cells from the pancreas of a mammal to produce pancreatic cells;

contacting the pancreatic cells with at least five antibodies and/or functional fragments thereof each having specific affinity for a different marker protein selected from the group consisting of c-Met, c-Kit, CD45, TER119, and Flk-1; and

separating the pancreatic stem cells from the pancreatic cells based on antibody binding between the antibodies and/or functional fragments thereof and the marker proteins to produce separated cells.

77. (Withdrawn) A method of identifying a pancreatic stem cell of a mammal, comprising:

isolating mRNA from pancreatic cells of a mammal to produce pancreatic mRNA;

contacting the pancreatic mRNA with probes and/or primer pairs having specific affinity for at least four genes each encoding a different corresponding marker protein selected from the group consisting of c-Met, c-Kit, CD45, and TER119; and

separating the pancreatic stem cells from the pancreatic cells based on hybridization between the probe and/or the primer pair and the at least four genes each encoding a different corresponding marker protein to produce identified pancreatic stem cells.

78. (Withdrawn) A method of identifying a pancreatic stem cell of a mammal, comprising:

isolating mRNA from pancreatic cells of a mammal to produce pancreatic mRNA;

contacting the pancreatic mRNA with probes and/or primer pairs having specific affinity for at least five genes each encoding a different corresponding marker protein selected from the group consisting of c-Met, c-Kit, CD45, TER119, and Flk-1; and

separating the pancreatic stem cells from the pancreatic cells based on hybridization between the probe and/or the primer pair and the at least five genes each encoding a different corresponding marker protein to produce identified pancreatic stem cells.

79. (Previously presented) The method of claim 75, further comprising:

recovering pancreatic stem cells from the separated cells comprising removing CD45⁺ cells and TER119⁺ cells from the separated cells to produce a cell population comprising CD45⁻ cells and TER119⁻.

80. (Previously presented) The method of claim 79, further comprising:

fractionating the CD45⁻ cells and TER119⁻ cell population comprising separating the CD45⁻ cells and TER119⁻ cell population into c-Met⁺/c-Kit⁺/CD45⁻/TER119⁻, c-Met⁻/c-Kit⁺/CD45⁻/TER119⁻, c-Met⁺/c-Kit⁺/CD45⁻/TER119⁺, and c-Met⁻/c-Kit⁺/CD45⁻/TER119⁺, cell fractions.

81. (Withdrawn) The method of claim 80, further comprising identifying a pancreatic stem cell, comprising

culturing the cells from each cell fraction to produce one or more cell colonies;

isolating mRNA from each of the one or more cell colonies to produce one or more corresponding isolated mRNAs;

contacting the one or more corresponding isolated mRNAs with probes and/or primer pairs having specific affinity for four or more genes each encoding a different corresponding marker protein selected from the group consisting of c-Met, c-Kit, CD45, and TER119; and

identifying the pancreatic stem cells based on hybridization between the probe and/or the primer pair and the four or more genes each encoding a different corresponding marker protein to produce identified pancreatic stem cells.

82. (Withdrawn) The method of claim 81, wherein the identified pancreatic stem cells comprise c-Met⁺, c-Kit⁻, CD45⁻, and TER119⁻.

83. (Previously presented) The method of claim 76, further comprising:

recovering pancreatic stem cells from the separated cells comprising removing CD45⁺ cells and TER119⁺ cells from the separated cells to produce a cell population comprising CD45⁻ and TER119⁻ cells.

84. (Previously presented) The method of claim 83, further comprising:

fractionating the CD45⁻ and TER119⁻ cell population comprising separating the CD45⁻ cells and TER119⁻ cell population into c-Met⁺/c-Kit⁻/CD45⁻/TER119⁻, c-Met⁻/c-Kit⁺/CD45⁻/TER119⁻, c-Met⁺/c-Kit⁺/CD45⁻/TER119⁻, and c-Met⁻/c-Kit⁻/CD45⁻/TER119⁻ cell fractions.

85. (Previously presented) The method of claim 84, further comprising separating the c-Met⁺/c-Kit⁻/CD45⁻/TER119⁻ cell fraction into a c-Met⁺/c-Kit⁻/CD45⁻/TER119⁻/Flk-1⁺ cell fraction and a c-Met⁺/c-Kit⁻/CD45⁻/TER119⁻/Flk-1⁻ cell fraction.

86. (Withdrawn) The method of claim 85, further comprising identifying a pancreatic stem cell, comprising

culturing the cells from each cell fraction to produce one or more cell colonies;

isolating mRNA from each of the one or more cell colonies to produce one or more corresponding isolated mRNAs;

contacting the one or more corresponding isolated mRNAs with probes and/or primer pairs having specific affinity for five or more genes each encoding a different corresponding marker protein selected from the group consisting of c-Met, c-Kit, CD45, TER119, and Flk-1; and

identifying the pancreatic stem cells from the pancreatic cells based on hybridization between the probe and/or the primer pair and the two or more genes each encoding a different corresponding marker protein to produce

identified pancreatic stem cells.

87. (Withdrawn) The method of claim 86, wherein the identified pancreatic stem cells comprise c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻, and Flk-1⁻.

88. (Previously presented) An isolated pancreatic stem cell that can be separated from the pancreas of a mammal by the method described in claim 75.

89. (Withdrawn) The method of claim 77, wherein the identified cells express a marker protein pattern of c-Met⁺, c-Kit⁻, CD45⁻ and TER119⁻.

90. (Withdrawn) The method of claim 78, wherein the identified cells express a marker protein pattern of c-Met⁺, c-Kit⁻, CD45⁻, TER119⁻ and Flk-1⁻.